AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A packet retransmission system which includes a transmission apparatus

for transmitting a packet ~~where a~~ with an added sequence number ~~is added~~, a reception apparatus

connected to the transmission apparatus through a network, and a request application unit

connected to the reception apparatus, for retransmitting the packet ~~where~~ with the added

sequence number ~~is added~~ between the transmission apparatus and the reception apparatus ~~at~~ in

response to a loss of the packet in packet transmission, the transmission apparatus comprising:

a retransmission buffer for storing ~~the~~ one or more packets, which have ~~having~~ been

transmitted to the reception apparatus;

retransmission-request receiving means for identifying the sequence number and a ~~largest~~

~~(latest)~~ latest sequence number provided to the request application unit, in a retransmission-

request packet received from the reception apparatus, and notifying the sequence number and the

~~largest (latest)~~ latest sequence number;

retransmission packet detecting means for detecting whether a notified sequence number

exists in the retransmission buffer,

retransmission buffer deleting means for comparing the sequence numbers of the packets

stored in the retransmission buffer to the latest sequence number notified by the retransmission-

request receiving means, and deleting packets from the retransmission buffer based on the

comparison; and

retransmission means for retransmitting all packets detected by the retransmission packet

detecting means to the reception apparatus.

2. (Currently Amended) A packet retransmission system which includes a transmission apparatus

for transmitting a packet ~~where a~~ with an added sequence number ~~is added~~, a reception apparatus

connected to the transmission apparatus through a network, and a request application unit

connected to the reception apparatus, for retransmitting the packet ~~where~~ with the added

sequence number ~~is added~~ between the transmission apparatus and the reception apparatus ~~at~~ in

response to a loss of the packet in packet transmission, the reception apparatus comprising:

a reception buffer for storing ~~the~~ packets with added sequence numbers received from the

transmission apparatus;

receiving means for storing the packets received from the transmission apparatus in the

reception buffer, ~~with sorting~~ the packets being stored in order of the sequence numbers;

packet loss detecting means for detecting a ~~loss of the~~ lost packet;

retransmission sequence number adding means for sending an instruction to add the sequence

number of ~~a~~ the lost packet detected by the packet loss detecting means to a retransmission-

request list;

retransmission-request list managing means for adding the sequence number to the

retransmission-request list based on the instruction to add;

retransmission-request transmitting means for putting the sequence number stored in the

retransmission-request list, in a retransmission-request packet and sending the retransmission-

request packet to the transmission apparatus; and

packet providing means for providing the packets in the reception buffer to the request

application unit.

<u>wherein the retransmission-request transmitting means is operable to include a latest</u>

<u>sequence number in the retransmission-request packet, the latest sequence number being the</u>

<u>sequence number of the packet most recently received and provided to the request application</u>

<u>unit</u>.

3. (Currently Amended) A packet retransmission system which includes a transmission apparatus

for transmitting a packet ~~where a~~ <u>with an added</u> sequence number ~~is added~~, a reception apparatus

connected to the transmission apparatus through a network, and a request application unit

connected to the reception apparatus, for retransmitting the packet ~~where~~ <u>with</u> the <u>added</u>

sequence number ~~is added~~ between the transmission apparatus and the reception apparatus at a

loss of the packet in packet transmission,

<u>wherein</u> the transmission apparatus ~~comprising~~ <u>comprises</u>:

a retransmission buffer for storing ~~the~~ <u>one or more</u> packets<u>, which have</u> ~~having~~

been transmitted to the reception apparatus;

retransmission-request receiving means for identifying the sequence number and a

~~largest (latest)~~ <u>latest</u> sequence number provided to the request application unit, in a

retransmission-request packet received from the reception apparatus, and notifying the sequence

number and the ~~largest (latest)~~ <u>latest</u> sequence number;

retransmission packet detecting means for detecting whether a notified sequence

number exists in the retransmission buffer<u>,</u>

<u>retransmission buffer deleting means for comparing the sequence numbers of the</u>

<u>packets stored in the retransmission buffer to the largest sequence number notified by the</u>

retransmission-request receiving means, and deleting packets from the retransmission buffer

based on the comparison; and

retransmission means for retransmitting all packets detected by the retransmission

packet detecting means to the reception apparatus, and

wherein the reception apparatus comprising comprises:

a reception buffer for storing the packets with added sequence numbers received

from the transmission apparatus;

receiving means for storing the packets received from the transmission apparatus

in the reception buffer, with sorting the packets being stored in the reception buffer in order of

the sequence numbers;

a packet loss detecting means for detecting the loss of the a lost packet;

retransmission sequence number adding means for sending an instruction to add

the sequence number of a the lost packet detected by the packet loss detecting means to a

retransmission-request list;

retransmission-request list managing means for adding the sequence number to

the retransmission-request list based on the instruction to add;

retransmission-request transmitting means for putting the sequence number stored

in the retransmission-request list, in the retransmission-request packet and sending the

retransmission-request packet to the transmission apparatus; and

packet providing means for providing the packets in the reception buffer to the

request application unit,

_____ wherein the retransmission-request transmitting means is operable to include the latest sequence number in the retransmission-request packet, the latest sequence number being the sequence number of the packet most recently received and provided to the request application unit by the reception apparatus.

4. (Original) The packet retransmission system of claim 3,

the transmission apparatus including:

retransmission packet storing means for storing one of a specific packet and a packet to be retransmitted at packet loss, in the retransmission buffer, and

retransmission means for retransmitting one of the specific packet and the packet to be retransmitted at packet loss,

the reception apparatus including:

receiving means for receiving one of the specific packet and the packet to be retransmitted at packet loss, and storing one of the specific packet and the packet to be retransmitted at packet loss, with sorting in order of the sequence number, in the reception buffer.

5. (Original) The packet retransmission system of claim 2 , 3, or 4,

the reception apparatus including

retransmission-request list managing means for creating a retransmission-request list which stores a sequence number of a packet currently being requested to retransmit and a

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sequence number of a packet to be requested retransmission at a next retransmission request

time, for adding and deleting the sequence number, and for switching a status of the packet of the

sequence number stored in the retransmission-request list to be a retransmission request status.

6. (Original) The packet retransmission system of claim 2, 3, or 4,

the reception apparatus including:

packet loss detecting means for detecting a sequence number of a lost packet based on

sequence number inconsistency of packets in the reception buffer, at packet receiving intervals

depending upon a number of times of receiving packets and a receiving time,

retransmission sequence number adding means for sending an instruction to add the

sequence number of the lost packet detected by the packet loss detecting means into the

retransmission-request list, to the retransmission-request list managing means, and

retransmission-request notifying means for sending an instruction to make a status of the

retransmission-request list "READY" indicating a waiting status for receiving a retransmission

packet, to the retransmission-request list managing means.

7. (Original) The packet retransmission system of claim 3 or claim 4,

the reception apparatus including

retransmission-request transmitting means for creating one retransmission-request packet

including at least one sequence number of packet to be retransmitted existing in the

retransmission-request list, and transmitting the retransmission-request packet to the transmission

apparatus,

the transmission apparatus including:

retransmission-request receiving means for extracting the sequence number in the retransmission-request packet received from the reception apparatus and notifying the sequence number;

retransmission packet detecting means for detecting whether the packet of notified sequence number exists in the retransmission buffer;

retransmission-request responding means for putting sequence numbers of all packets detected by the retransmission packet detecting means in one retransmission-request response packet and transmitting the retransmission-request response packet to the reception apparatus; and

retransmission means for retransmitting all the packets detected by the retransmission packet detecting means to the reception apparatus.

8. (Original) The packet retransmission system of claim 3 or claim 4,

the reception apparatus including

retransmission-request transmitting means for creating a retransmission-request packet including the largest (latest) sequence number of packet provided to the request application unit by the packet providing means, and transmitting the retransmission-request packet to the transmission apparatus,

the transmission apparatus including:

retransmission-request receiving means for extracting the largest sequence number in the

retransmission-request packet received from the reception apparatus and notifying the largest

sequence number; and

retransmission buffer deleting means for deleting packets of sequence numbers smaller

than the largest sequence number notified by the retransmission-request receiving means, from

the retransmission buffer.

9. (Original) The packet retransmission system of claim 3 or claim 4,

the reception apparatus including

retransmission-request transmitting means for creating a retransmission-request packet

including at least one sequence number of packet to be retransmitted existing in the

retransmission-request list and the largest (latest) sequence number of packet provided to the

request application unit by the packet providing means, and transmitting the retransmission-

request packet to the transmission apparatus,

the transmission apparatus including:

retransmission-request receiving means for extracting the sequence number and the

largest sequence number in the retransmission-request packet received from the reception

apparatus, and notifying the sequence number and the largest sequence number, and

retransmission packet detecting means for detecting whether the packet of notified

sequence number means exists in the retransmission buffer,

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retransmission buffer deleting means for deleting packets of sequence numbers smaller

than the largest sequence number notified by the retransmission-request receiving means, from

the retransmission buffer;

retransmission-request responding means for putting sequence numbers of all packets

detected by the retransmission packet detecting means in one retransmission-request response

packet and transmitting the retransmission-request response packet to the reception apparatus;

and

retransmission means for retransmitting packets detected by the retransmission packet

detecting means to the reception apparatus.

10. (Previously Presented) The packet retransmission system of claim 3 or claim 4,

the reception apparatus including:

retransmission-request response receiving means for receiving a retransmission-request

response packet including the sequence number of the packet to be retransmitted, from the

transmission apparatus; and

retransmission sequence number deleting means for extracting the sequence number from

the retransmission-request response packet, and sending an instruction to delete a same sequence

number as an extracted sequence number from the retransmission-request list, to the

retransmission-request list managing means.

11. (Previously Presented) The packet retransmission system of claim 3 or claim 4,

the reception apparatus including:

retransmission-request response receiving means for receiving a retransmission-request

response packet including the sequence number of the packet to be retransmitted, from the

transmission apparatus;

retransmission sequence number deleting means for extracting the sequence number from

the retransmission-request response packet, and sending an instruction to delete a same sequence

number as an extracted sequence number from the retransmission-request list, to the

retransmission-request list managing means; and

retransmission-request response notifying means for sending an instruction to make a

status of the retransmission-request list "ACTIVE" to the retransmission-request list managing

means, where the ACTIVE indicates a status that no packet will be retransmitted from the

transmission apparatus though retransmission of the packet whose sequence number is in the

retransmission-request list has been requested.

12. (Original) The packet retransmission system of claim 2, 3, or 4,

the reception apparatus including:

packet providing means for providing payload (data) of at least one packet out of packets

stored in the reception buffer to the request application unit,

deleting sequence numbers smaller than a sequence number of the packet, from

the retransmission-request list,

providing payload of packet of next sequence number (N + 1) coming after a

sequence number (N being a natural number) of a packet provided last time, within a specific

time, and

when the packet of next sequence number (N + 1) does not exist in the reception

buffer and is not inserted into the reception buffer within the specific time, notifying the request

application unit of a loss of the packet to be provided.

13. (Previously Presented) The packet retransmission system of claim 8

the reception apparatus including

packet providing means, when a packet to be provided within a specific time does not

exist in the reception buffer, for performing a packet loss detection and a retransmission-request

transmission at least once within the specific time.

14. (Previously Presented) The packet retransmission system of claim 8

the reception apparatus including

packet providing means, when a status of the retransmission-request list is ACTIVE

indicating a status that no packet will be retransmitted from the transmission apparatus though

retransmission of the packet whose sequence number is in the retransmission-request list has

been requested, and when a sequence number of a packet to be provided to the request

application unit exists in the retransmission-request list, for judging that no packet will be

retransmitted even if retransmission-request is performed, and notifying a requestor, without

waiting for the specific time having passed, that the packet to be provided is lost.

15. (Original) The packet retransmission system of claim 3 or claim 4, for the packet

transmission between the transmission apparatus and the reception apparatus at the loss of the

packet, where a general sequence number is added to each of all packets and a priority sequence

number is added to one of a specific packet and a packet to be retransmitted at packet loss,

the transmission apparatus including:

retransmission packet storing means for storing one of the specific packet and the packet

to be retransmitted at packet loss, in the retransmission buffer; and

retransmission means for retransmitting one of the specific packet and the packet to be

retransmitted at packet loss,

the reception apparatus including

receiving means for receiving one of the specific packet and the packet to be

retransmitted at packet loss, and storing one of the specific packet and the packet to be

retransmitted at packet loss, with sorting in order of the general sequence number, in the

reception buffer.

16. (Original) The packet retransmission system of claim 15,

the reception apparatus including

retransmission list managing means for creating a retransmission list which stores the

general sequence number of packet to be retransmitted, and adding and deleting the general

sequence number.

17. (Original) The packet retransmission system of claim 15,

the reception apparatus including:

retransmission sequence number deleting means, when the general sequence number of

packet received by the receiving means exists in a retransmission list, for sending an instruction

to delete the general sequence number from the retransmission list to retransmission list

managing means;

packet loss detecting means for detecting a general sequence number of a specific packet

of high priority which has been lost and the general sequence number of the packet to be

retransmitted at packet loss, which has been lost, based on the general sequence number and the

priority sequence number of the packet in the reception buffer and of a received packet, at packet

receiving intervals depending upon a number of times of receiving packets and a receiving time

and at every loss of packet of high priority found based on inconsistency of priority sequence

numbers, and

retransmission sequence number adding means for sending an instruction to add the

general sequence number of the specific packet of high priority whose loss is detected by the

packet loss detecting means and the general sequence number of the packet to be retransmitted at

packet loss, whose loss is detected by the packet loss detecting means, into the retransmission

list, to the retransmission list managing means.

18. (Original) The packet retransmission system of claim 15,

the reception apparatus including

retransmission-request transmitting means for creating a retransmission-request packet

including at least one general sequence number of packet existing in the retransmission list, and

transmitting the retransmission-request packet to the transmission apparatus,

the transmission apparatus including:

retransmission-request receiving means for extracting the general sequence number in the

retransmission-request packet received from the reception apparatus and notifying the general

sequence number,

retransmission packet detecting means for detecting whether a packet of notified general

sequence number exists in the retransmission buffer, and

retransmission means for retransmitting the packet of the general sequence number

detected by the retransmission packet detecting means to the reception apparatus.

19. (Original) The packet retransmission system of claim 15,

the reception apparatus including

retransmission-request transmitting means for creating a retransmission-request packet

including a largest (latest) general sequence number of packet provided to the request application

unit by the packet providing means, and transmitting the retransmission-request packet to the

transmission apparatus,

the transmission apparatus including:

retransmission-request receiving means for extracting the largest general sequence

number in the retransmission-request packet received from the reception apparatus, and notifying

the largest general sequence number; and

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retransmission buffer deleting means for deleting packets of general sequence numbers

smaller than the largest general sequence number notified by the retransmission-request

receiving means, from the retransmission buffer.

20. (Original) The packet retransmission system of claim 15,

the reception apparatus including

retransmission-request transmitting means for creating a retransmission-request packet

including at least one general sequence number in the retransmission list and a largest (latest)

general sequence number of packet provided to the request application unit by the packet

providing means, and transmitting the retransmission-request packet to the transmission

apparatus,

the transmission apparatus including:

retransmission-request receiving means for extracting the general sequence number and

the largest general sequence number in the retransmission-request packet received from the

reception apparatus and notifying the general sequence number and the largest general sequence

number,

retransmission buffer deleting means for deleting packets of general sequence numbers

smaller than the largest general sequence number notified by the retransmission-request

receiving means, from the retransmission buffer,

retransmission packet detecting means for detecting whether the packet of notified

general sequence number exists in the retransmission buffer, and

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retransmission means for retransmitting packets of the general sequence numbers

detected by the retransmission packet detecting means, to the reception apparatus,

21. (Original) The packet retransmission system of claim 15,

the reception apparatus including:

packet providing means for providing payload (data) of at least one packet out of packets

stored in the reception buffer to the request application unit,

deleting general sequence numbers smaller than a general sequence number of the

packet, from the retransmission-request list,

providing payload of packet of next general sequence number (N + 1) coming

after a general sequence number (N being a natural number) of a packet provided last time,

within a specific time, and

when the packet of next general sequence number (N + 1) does not exist in the

reception buffer and is not inserted into the reception buffer within the specific time, notifying

the request application unit of a loss of the packet to be provided.

22. (Original) The packet retransmission system of claim 20,

the reception apparatus including

packet providing means, when a packet to be provided within a specific time does not

exist in the reception buffer, for performing a packet loss detection and a retransmission-request

transmission several times within the specific time.

23. (Original) The packet retransmission system of claim 20,

the reception apparatus including

packet providing means, when a general sequence number of a packet to be provided

does not exist in the retransmission list, for notifying the request application unit that the packet

to be provided is lost, without waiting for the specific time having passed.

24. (Currently Amended) The packet retransmission system of claim 3 or claim 4,

the transmission apparatus including

priority information adding means for adding priority information to an optional packet p

coming every m packets (m $\leq$n, m and n are natural numbers), wherein the priority information

is information about packets of high priority and packets to be retransmitted at a packet loss,

which are located in a range of n packets from the packet p, and for deciding values of m and n

depending upon a network congestion status,

the reception apparatus including

packet loss detecting means for detecting a sequence number of a packet of high priority

which has been lost and a sequence number of packet to be retransmitted at packet loss which

has been lost, based on a packet in the reception buffer and sequence number of a received

packet and on the priority information, at packet receiving intervals depending upon a difference

between sequence numbers or time stamps of times of receiving received packets, and a

receiving time, and at every loss of important packet found based on inconsistency of sequence

numbers.

25. (Currently Amended) A packet retransmission method, including a transmission apparatus

for transmitting a packet ~~where a~~ with an added sequence number ~~is added~~, a reception apparatus

connected to the transmission apparatus through a network, and a request application unit

connected to the reception apparatus, for retransmitting the packet ~~where~~ with the added

sequence number ~~is added~~ between the transmission apparatus and the reception apparatus ~~at~~ in

response to a loss of the packet in packet transmission, the transmission apparatus including

~~comprising:~~ a retransmission buffer for storing ~~the~~ one or more packets, which have ~~having~~ been

transmitted to the reception apparatus, the method comprising: ~~;~~

a retransmission-request receiving step of identifying the sequence number and a ~~largest~~

~~(latest)~~ latest sequence number provided to the request application unit, in a retransmission-

request packet received from the reception apparatus, and notifying the sequence number and the

~~largest (latest)~~ latest sequence number;

a retransmission packet detecting step of detecting whether a notified sequence number

exists in the retransmission buffer;

a retransmission buffer deleting step for comparing the sequence numbers of the packets

stored in the retransmission buffer to the latest sequence number notified by the retransmission-

request receiving step, and deleting packets from the retransmission buffer based on the

comparison; and

a retransmitting step of retransmitting all packets detected by the retransmission packet

detecting step to the reception apparatus.

26. (Currently Amended) A packet retransmission method, including a transmission apparatus

for transmitting a packet ~~where a~~ with an added sequence number ~~is added~~, a reception apparatus

connected to the transmission apparatus through a network, and a request application unit

connected to the reception apparatus, for retransmitting the packet ~~where~~ with the added

sequence number ~~is added~~ between the transmission apparatus and the reception apparatus ~~at~~ in

response to a loss of the packet in packet transmission, the reception apparatus ~~comprising:~~

including a reception buffer for storing ~~the~~ packets with added sequence numbers received from

the transmission apparatus, the method comprising: ~~;~~

a receiving step of storing the packet received from the transmission apparatus in the

reception buffer, ~~with sorting~~ the packets being stored in order of the sequence number~~s~~;

a packet loss detecting step of detecting a ~~loss of the~~ lost packet;

a retransmission sequence number adding step of sending an instruction to add the

sequence number of ~~a~~ the lost packet detected by the packet loss detecting step to a

retransmission-request list;

a retransmission-request list managing step of adding the sequence number to the

retransmission-request list based on the instruction to add;

a retransmission-request transmitting step of putting the sequence number stored in the

retransmission-request list, in a retransmission-request packet and sending the retransmission-

request packet to the transmission step; and

a packet providing step of providing the packet in the reception buffer to the request

application unit,

wherein the retransmission-request transmitting step includes a latest sequence number in

the retransmission-request packet, the latest sequence number being the sequence number of the

packet most recently received and provided to the request application unit.

27. (Currently Amended) A packet retransmission method, including a transmission apparatus

for transmitting a packet where a with an added sequence number is added, a reception apparatus

connected to the transmission apparatus through a network, and a request application unit

connected to the reception apparatus, for retransmitting the packet where with the added

sequence number is added between the transmission apparatus and the reception apparatus at a

loss of the packet in packet transmission, the transmission apparatus comprising: including a

retransmission buffer for storing the one or more packets, which have having been transmitted to

the reception apparatus, the method comprising: ;

    at the transmission apparatus,

        a retransmission-request receiving step of identifying the sequence number and a

largest (latest) latest sequence number provided to the request application unit, in a

retransmission-request packet received from the reception apparatus, and notifying the sequence

number and the largest (latest) latest sequence number;

        a retransmission packet detecting step of detecting whether a notified sequence

number exists in the retransmission buffer;

        a retransmission buffer deleting step of comparing the sequence numbers of the

packets stored in the retransmission buffer to the largest sequence number notified by the

retransmission-request receiving step, and deleting packets from the retransmission buffer based

on the comparison; and

a retransmitting step of retransmitting all packets detected by the retransmission

packet detecting step to the reception apparatus, and

at the reception apparatus, which includes comprising: a reception buffer for storing the

packets with added sequence numbers received from the transmission apparatus, ;

a receiving step of storing the packet received from the transmission apparatus in

the reception buffer, with sorting the packets being stored in the reception buffer in order of the

sequence numbers;

a packet loss detecting step of detecting a loss of the lost packet;

a retransmission sequence number adding step of sending an instruction to add the

sequence number of a the detected lost packet to a retransmission-request list;

a retransmission-request list managing step of adding the sequence number to the

retransmission-request list based on the instruction to add;

a retransmission-request transmitting step of putting the sequence number stored

in the retransmission-request list, in a retransmission-request packet and sending the

retransmission-request packet to the transmission apparatus; and

a packet providing step of providing the packet in the reception buffer to the

request application unit,

wherein the retransmission-request transmitting step includes a latest sequence number in

the retransmission-request packet, the latest sequence number being the sequence number of the

packet most recently received and provided to the request application unit by the reception

apparatus.

28. (Original) The packet retransmission method of claim 27,

the transmission apparatus including:

      a retransmission packet storing step of storing one of a specific packet and a packet to be

retransmitted at packet loss, in the retransmission buffer, and

      a retransmitting step of retransmitting one of the specific packet and the packet to be

retransmitted at packet loss,

the reception apparatus including:

      a receiving step of receiving one of the specific packet and the packet to be retransmitted

at packet loss, and storing one of the specific packet and the packet to be retransmitted at packet

loss, with sorting in order of the sequence number, in the reception buffer.

29. (Original) The packet retransmission method of claim 26, 27, or 28,

the reception apparatus including

      a retransmission-request list managing step of creating a retransmission-request list which

stores a sequence number of a packet currently being requested to retransmit and a sequence

number of a packet to be requested retransmission at a next retransmission request time, of

adding and deleting the sequence number, and of switching a status of the packet of the sequence

number stored in the retransmission-request list to be a retransmission request status.

30. (Original) The packet retransmission method of claim 26, 27, or 28,

the reception apparatus including:

a packet loss detecting step of detecting a sequence number of a lost packet based on

sequence number inconsistency of packets in the reception buffer, at packet receiving intervals

depending upon a number of times of receiving packets and a receiving time;

a retransmission sequence number adding step of sending an instruction to add the

sequence number of the lost packet detected by the packet loss detecting step into the

retransmission-request list, to the retransmission-request list managing step; and

a retransmission-request notifying step of sending an instruction to make a status of the

retransmission-request list "READY" indicating a waiting status for receiving a retransmission

packet, to the retransmission-request list managing step.

31. (Original) The packet retransmission method of claim 27 or claim 28,

the reception apparatus including

a retransmission-request transmitting step of creating one retransmission-request packet

including at least one sequence number of packet to be retransmitted existing in the

retransmission-request list, and transmitting the retransmission-request packet to the transmission

apparatus,

the transmission apparatus including:

a retransmission-request receiving step of extracting the sequence number in the

retransmission-request packet received from the reception apparatus and notifying the sequence

number;

a retransmission packet detecting step of detecting whether the packet of notified

sequence number exists in the retransmission buffer;

a retransmission-request responding step of putting sequence numbers of all packets

detected by the retransmission packet detecting step in one retransmission-request response

packet and transmitting the retransmission-request response packet to the reception apparatus;

and

a retransmitting step of retransmitting all the packets detected by the retransmission

packet detecting step to the reception apparatus.

32. (Original) The packet retransmission method of claim 27 or claim 28,

the reception apparatus including

a retransmission-request transmitting step of creating a retransmission-request packet

including the largest (latest) sequence number of packet provided to the request application unit

by the packet providing step, and transmitting the retransmission-request packet to the

transmission apparatus,

the transmission apparatus including:

a retransmission-request receiving step of extracting the largest sequence number in the

retransmission-request packet received from the reception apparatus and notifying the largest

sequence number; and

a retransmission buffer deleting step of deleting packets of sequence numbers smaller

than the largest sequence number notified by the retransmission-request receiving step, from the

retransmission buffer.

33. (Original) The packet retransmission method of claim 27 or claim 28,

the reception apparatus including

a retransmission-request transmitting step of creating a retransmission-request packet

including at least one sequence number of packet to be retransmitted existing in the

retransmission-request list and the largest (latest) sequence number of packet provided to the

request application unit by the packet providing step, and transmitting the retransmission-request

packet to the transmission apparatus,

the transmission apparatus including:

a retransmission-request receiving step of extracting the sequence number and the largest

sequence number in the retransmission-request packet received from the reception apparatus, and

notifying the sequence number and the largest sequence number;

a retransmission packet detecting step of detecting whether the packet of notified

sequence number exists in the retransmission buffer;

a retransmission buffer deleting step of deleting packets of sequence numbers smaller

than the largest sequence number notified by the retransmission-request receiving step, from the

retransmission buffer;

a retransmission-request responding step of putting sequence numbers of all packets

detected by the retransmission packet detecting step in one retransmission-request response

packet and transmitting the retransmission-request response packet to the reception apparatus;

and

a retransmitting step of retransmitting packets detected by the retransmission packet

detecting step to the reception apparatus.

34. (Previously Presented) The packet retransmission method of claim 27 or claim 28,

the reception apparatus including:

a retransmission-request response receiving step of receiving a retransmission-request

response packet including the sequence number of the packet to be retransmitted, from the

transmission apparatus; and

a retransmission sequence number deleting step of extracting the sequence number from

the retransmission-request response packet, and sending an instruction to delete a same sequence

number as an extracted sequence number from the retransmission-request list, to the

retransmission-request list managing step.

35. (Previously Presented) The packet retransmission method of claim 27 or claim 28,

the reception apparatus including:

a retransmission-request response receiving step of receiving a retransmission-request

response packet including the sequence number of the packet to be retransmitted, from the

transmission apparatus;

a retransmission sequence number deleting step of extracting the sequence number from

the retransmission-request response packet, and sending an instruction to delete a same sequence

number as an extracted sequence number from the retransmission-request list, to the

retransmission-request list managing step; and

a retransmission-request response notifying step of sending an instruction to make a

status of the retransmission-request list "ACTIVE" to the retransmission-request list managing

step, where the ACTIVE indicates a status that no packet will be retransmitted from the

transmission apparatus though retransmission of the packet whose sequence number is in the

retransmission-request list has been requested.

36. (Original) The packet retransmission method of claim 26, 27, or 28,

the reception apparatus including:

a packet providing step of providing payload (data) of at least one packet out of packets

stored in the reception buffer to the request application unit,

deleting sequence numbers smaller than a sequence number of the packet, from

the retransmission-request list,

providing payload of packet of next sequence number (N + 1) coming after a

sequence number (N being a natural number) of a packet provided last time, within a specific

time, and

when the packet of next sequence number (N + 1) does not exist in the reception

buffer and is not inserted into the reception buffer within the specific time, notifying the request

application unit of a loss of the packet to be provided.

37. (Previously Presented) The packet retransmission method of claim 32

the reception apparatus including

a packet providing step, when the packet to be provided within a specific time does not

exist in the reception buffer, of performing a packet loss detection and a retransmission-request

transmission at least once within the specific time.

38. (Previously Presented) The packet retransmission method of claim 32

the reception apparatus including

a packet providing step, when a status of the retransmission-request list is ACTIVE

indicating a status that no packet will be retransmitted from the transmission apparatus though

retransmission of the packet whose sequence number is in the retransmission-request list has

been requested, and when a sequence number of a packet to be provided to the request

application unit exists in the retransmission-request list, of judging that no packet will be

retransmitted even if retransmission-request is performed, and notifying a requestor, without

waiting for the specific time having passed, that the packet to be provided is lost.

39. (Original) The packet retransmission method of claim 27 or claim 28, for the packet

transmission between the transmission apparatus and the reception apparatus at the loss of the

packet, where a general sequence number is added to each of all packets and a priority sequence

number is added to one of a specific packet and a packet to be retransmitted at packet loss,

the transmission apparatus including:

a retransmission packet storing step of storing one of the specific packet and the packet to

be retransmitted at packet loss, in the retransmission buffer; and

a retransmitting step of retransmitting one of the specific packet and the packet to be

retransmitted at packet loss,

the reception apparatus including

a receiving step of receiving one of the specific packet and the packet to be retransmitted

at packet loss, and storing one of the specific packet and the packet to be retransmitted at packet

loss, with sorting in order of the general sequence number, in the reception buffer.

40. (Original) The packet retransmission method of claim 39,

the reception apparatus including

a retransmission list managing step of creating a retransmission list which stores the

general sequence number of packet to be retransmitted, and adding and deleting the general

sequence number.

41. (Currently Amended) The packet retransmission method of claim 39,

the reception apparatus including:

a retransmission sequence number deleting step, when the general sequence number of

packet received by the receiving step exists in a retransmission list, of sending an instruction to

delete the general sequence number from the retransmission list to retransmission list managing

step;

a packet loss detecting step of detecting a general sequence number of a specific packet

of high priority which has been lost and the general sequence number of the packet to be

retransmitted at packet loss, which has been lost, based on the general sequence number and the

priority sequence number of the packet in the reception buffer and of a received packet, at packet

receiving intervals depending upon a <u>difference between sequence numbers or time stamps</u> of

~~times of receiving~~<u>received</u> packets, and a receiving time, and at every loss of packet of high

priority found based on inconsistency of priority sequence numbers, and

a retransmission sequence number adding step of sending an instruction to add the

general sequence number of the specific packet of high priority whose loss is detected by the

packet loss detecting step and the general sequence number of the packet to be retransmitted at

packet loss, whose loss is detected by the packet loss detecting step, into the retransmission list,

to the retransmission list managing step.

42. (Original) The packet retransmission method of claim 39,

the reception apparatus including

a retransmission-request transmitting step of creating a retransmission-request packet

including at least one general sequence number of packet existing in the retransmission list, and

transmitting the retransmission-request packet to the transmission apparatus,

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the transmission apparatus including:

a retransmission-request receiving step of extracting the general sequence number in the

retransmission-request packet received from the reception apparatus and notifying the general

sequence number;

a retransmission packet detecting step of detecting whether a packet of notified general

sequence number exists in the retransmission buffer; and

a retransmitting step of retransmitting the packet of the general sequence number detected

by the retransmission packet detecting step to the reception apparatus.

43. (Original) The packet retransmission method of claim 39,

the reception apparatus including

a retransmission-request transmitting step of creating a retransmission-request packet

including a largest (latest) general sequence number of packet provided to the request application

unit by the packet providing step, and transmitting the retransmission-request packet to the

transmission apparatus,

the transmission apparatus including:

a retransmission-request receiving step of extracting the largest general sequence number

in the retransmission-request packet received from the reception apparatus, and notifying the

largest general sequence number; and

a retransmission buffer deleting step of deleting packets of general sequence numbers

smaller than the largest general sequence number notified by the retransmission-request

receiving step, from the retransmission buffer.

44. (Original) The packet retransmission method of claim 39,

the reception apparatus including:

a retransmission-request transmitting step of creating a retransmission-request packet

including at least one general sequence number in the retransmission list and a largest (latest)

general sequence number of packet provided to the request application unit by the packet

providing step, and transmitting the retransmission-request packet to the transmission apparatus,

the transmission apparatus including:

a retransmission-request receiving step of extracting the general sequence number and the

largest general sequence number in the retransmission-request packet received from the

reception apparatus and notifying the general sequence number and the largest general sequence

number;

a retransmission buffer deleting step of deleting packets of general sequence numbers

smaller than the largest general sequence number notified by the retransmission-request

receiving step, from the retransmission buffer;

a retransmission packet detecting step of detecting whether the packet of notified general

sequence number exists in the retransmission buffer; and

a retransmitting step of retransmitting packets of the general sequence numbers detected

by the retransmission packet detecting step, to the reception apparatus.

45. (Original) The packet retransmission method of claim 39,

the reception apparatus including:

a packet providing step of providing payload (data) of at least one packet out of packets

stored in the reception buffer to the request application unit,

deleting general sequence numbers smaller than a general sequence number of the

packet, from the retransmission-request list,

providing payload of packet of next general sequence number (N + 1) coming

after a general sequence number (N being a natural number) of a packet provided last time,

within a specific time, and

when the packet of next general sequence number (N + 1) does not exist in the

reception buffer and is not inserted into the reception buffer within the specific time, notifying

the request application unit of a loss of the packet to be provided.

46. (Original) The packet retransmission method of claim 44,

the reception apparatus including

a packet providing step, when a packet to be provided within a specific time does not

exist in the reception buffer, of performing a packet loss detection and a retransmission-request

transmission several times within the specific time.

47. (Original) The packet retransmission method of claim 44,

the reception apparatus including

   a packet providing step, when a general sequence number of a packet to be provided does

not exist in the retransmission list, of notifying the request application unit that the packet to be

provided is lost, without waiting for the specific time having passed.

48. (Currently Amended) The packet retransmission method of claim 27 or claim 28,

the transmission apparatus including

   a priority information adding step of adding priority information to an optional packet p

coming every m packets (m $\leq$ n, m and n are natural numbers), wherein the priority information

is information about packets of high priority and packets to be retransmitted at a packet loss,

which are located in a range of n packets from the packet p, and for deciding values of m and n

depending upon a network congestion status,

the reception apparatus including

   a packet loss detecting step of detecting a sequence number of a packet of high priority

which has been lost and a sequence number of packet to be retransmitted at packet loss which

has been lost, based on a packet in the reception buffer and sequence number of a received

packet and on the priority information, at packet receiving intervals depending upon a difference

between sequence numbers or time stamps of times of receiving received packets, and a

receiving time, and at every loss of important packet found based on inconsistency of sequence

numbers.

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49. (New) A packet retransmission system which includes a transmission apparatus for

transmitting a packet with an added sequence number, a reception apparatus connected to the

transmission apparatus through a network, and a request application unit connected to the

reception apparatus, for retransmitting the packet with the added sequence number between the

transmission apparatus and the reception apparatus in response to a loss of the packet in packet

transmission, the transmission apparatus comprising:

a retransmission buffer for storing one or more packets, which have been transmitted to

the reception apparatus;

retransmission-request receiving means for identifying the sequence number and a latest

sequence number provided to the request application unit, in a retransmission-request packet

received from the reception apparatus, and notifying the sequence number and the latest

sequence number;

retransmission packet detecting means for detecting whether a notified sequence number

exists in the retransmission buffer; and

retransmission means for retransmitting all packets detected by the retransmission packet

detecting means to the reception apparatus,

wherein a priority status of each packet being transmitted to the reception apparatus is

dependent upon whether the corresponding sequence number exists in the retransmission buffer.

50. (New) A packet retransmission system which includes a transmission apparatus for

transmitting a packet with an added sequence number, a reception apparatus connected to the

transmission apparatus through a network, and a request application unit connected to the

reception apparatus, for retransmitting the packet with the added sequence number between the

transmission apparatus and the reception apparatus in response to a loss of the packet in packet

transmission, the reception apparatus comprising:

a reception buffer for storing packets with added sequence numbers received from the

transmission apparatus;

receiving means for storing the packets received from the transmission apparatus in the

reception buffer, the packets being stored in order of the sequence numbers;

packet loss detecting means for detecting a lost packet;

retransmission sequence number adding means for sending an instruction to add the

sequence number of the lost packet detected by the packet loss detecting means to a

retransmission-request list;

retransmission-request list managing means for adding the sequence number to the

retransmission-request list based on the instruction to add;

retransmission-request transmitting means for putting the sequence number stored in the

retransmission-request list, in a retransmission-request packet and sending the retransmission-

request packet to the transmission apparatus; and

packet providing means for providing the packet in the reception buffer to the request

application unit,

wherein, in response to receiving the retransmission-request packet, the transmission

apparatus notifies the reception apparatus whether the sequence number stored in the

retransmission-request list exists in the retransmission buffer, thereby indicating to the reception

apparatus a priority status associated with the lost packet.

51. (New) A packet retransmission system which includes a transmission apparatus for

transmitting a packet with an added sequence number, a reception apparatus connected to the

transmission apparatus through a network, and a request application unit connected to the

reception apparatus, for retransmitting the packet with the added sequence number between the

transmission apparatus and the reception apparatus at a loss of the packet in packet transmission,

      wherein the transmission apparatus comprises:

            a retransmission buffer for storing one or more packets, which have been

transmitted to the reception apparatus;

            retransmission-request receiving means for identifying the sequence number and a

latest sequence number provided to the request application unit, in a retransmission-request

packet received from the reception apparatus, and notifying the sequence number and the latest

sequence number;

            retransmission packet detecting means for detecting whether a notified sequence

number exists in the retransmission buffer; and

            retransmission means for retransmitting all packets detected by the retransmission

packet detecting means to the reception apparatus, and

      wherein the reception apparatus comprises:

            a reception buffer for storing packets with added sequence numbers received from

the transmission apparatus;

receiving means for storing the packets received from the transmission apparatus

in the reception buffer, the packets being stored in the reception buffer in order of the sequence

number;

a packet loss detecting means for detecting a lost packet;

retransmission sequence number adding means for sending an instruction to add

the sequence number of the lost packet detected by the packet loss detecting means to a

retransmission-request list;

retransmission-request list managing means for adding the sequence number to

the retransmission-request list based on the instruction to add;

retransmission-request transmitting means for putting the sequence number stored

in the retransmission-request list, in the retransmission-request packet and sending the

retransmission-request packet to the transmission apparatus; and

packet providing means for providing the packets in the reception buffer to the

request application unit,

wherein, in response to receiving the retransmission-request packet, the transmission

apparatus notifies the reception apparatus whether the sequence number stored in the

retransmission-request list exists in the retransmission buffer, thereby indicating to the reception

apparatus a priority status associated with the lost packet.

52. (New) A packet retransmission method, including a transmission apparatus for transmitting a

packet with an added sequence number, a reception apparatus connected to the transmission

apparatus through a network, and a request application unit connected to the reception apparatus,

for retransmitting the packet with the added sequence number between the transmission

apparatus and the reception apparatus in response to a loss of the packet in packet transmission,

the transmission apparatus including a retransmission buffer for storing one or more packets,

which have been transmitted to the reception apparatus, the method comprising:

a retransmission-request receiving step of identifying the sequence number and a latest

sequence number provided to the request application unit, in a retransmission-request packet

received from the reception apparatus, and notifying the sequence number and the latest

sequence number;

a retransmission packet detecting step of detecting whether a notified sequence number

exists in the retransmission buffer; and

a retransmitting step of retransmitting all packets detected by the retransmission packet

detecting step to the reception apparatus,

wherein a priority status of each packet being transmitted to the reception apparatus is

dependent upon whether the corresponding sequence number exists in the retransmission buffer.

53. (New) A packet retransmission method, including a transmission apparatus for transmitting a

packet with an added sequence number, a reception apparatus connected to the transmission

apparatus through a network, and a request application unit connected to the reception apparatus,

for retransmitting the packet with the added sequence number between the transmission

apparatus and the reception apparatus in response to a loss of the packet in packet transmission,

the reception apparatus including a reception buffer for storing packets with added sequence

numbers received from the transmission apparatus, the method comprising:

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a receiving step of storing the packet received from the transmission apparatus in the reception buffer, the packets being stored in order of the sequence numbers;

a packet loss detecting step of detecting a lost packet;

a retransmission sequence number adding step of sending an instruction to add the sequence number of the lost packet detected by the packet loss detecting step to a retransmission-request list;

a retransmission-request list managing step of adding the sequence number to the retransmission-request list based on the instruction to add;

a retransmission-request transmitting step of putting the sequence number stored in the retransmission-request list, in a retransmission-request packet and sending the retransmission-request packet to the transmission step; and

a packet providing step of providing the packet in the reception buffer to the request application unit,

wherein, in response to receiving the retransmission-request packet, the transmission apparatus notifies the reception apparatus whether the sequence number stored in the retransmission-request list exists in the retransmission buffer, thereby indicating to the retransmission apparatus a priority status associated with the lost packet.

54. (New) A packet retransmission method, including a transmission apparatus for transmitting a packet with an added sequence number, a reception apparatus connected to the transmission apparatus through a network, and a request application unit connected to the reception apparatus,

for retransmitting the packet with the added sequence number between the transmission

apparatus and the reception apparatus at a loss of the packet in packet transmission,

the transmission apparatus including a retransmission buffer for storing one or more packets,

which have been transmitted to the reception apparatus, the method comprising:

at the transmission apparatus,

a retransmission-request receiving step of identifying the sequence number and a

latest sequence number provided to the request application unit, in a retransmission-request

packet received from the reception apparatus, and notifying the sequence number and the latest

sequence number;

a retransmission packet detecting step of detecting whether a notified sequence

number exists in the retransmission buffer; and

a retransmitting step of retransmitting all packets detected by the retransmission

packet detecting step to the reception apparatus, and

at the reception apparatus, which includes a reception buffer for storing packets with the

added sequence numbers received from the transmission apparatus,

a receiving step of storing the packet received from the transmission apparatus in

the reception buffer, the packets being stored in the reception buffer in order of the sequence

numbers;

a packet loss detecting step of detecting the lost packet;

a retransmission sequence number adding step of sending an instruction to add the

sequence number of the detected lost packet to a retransmission-request list;

a retransmission-request list managing step of adding the sequence number to the

retransmission-request list based on the instruction to add;

a retransmission-request transmitting step of putting the sequence number stored

in the retransmission-request list, in a retransmission-request packet and sending the

retransmission-request packet to the transmission apparatus; and

a packet providing step of providing the packet in the reception buffer to the

request application unit,

wherein, in response to receiving the retransmission-request packet, the transmission

apparatus notifies the reception apparatus whether the sequence number stored in the

retransmission-request list exists in the retransmission buffer, thereby indicating to the reception

apparatus a priority status associated with the lost packet.